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(54) **SUPER RESOLUTION METHODS FOR ELECTRO-OPTICAL SYSTEMS**

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(57) **ABSTRACT**

There is disclosed in an optical system having a predetermined Numerical aperture which provides a corresponding level of spatial resolution and having detector means and processor means in which image data is obtained comprising noisy blurred scene data containing an object to be reconstructed, and noisy blurred background data of the same scene, an improved method for increasing the spatial resolution of the imaging data produced by the diffraction limited optical system. The improvement comprises filtering the noisy blurred background data of the same scene to obtain noise suppressed data; applying estimations of point spread functions associated with the noise suppressed data and optical system to estimates of the noise suppressed data to obtain a reconstructed background image ($I_r(x)$); and low pass filtering the noisy blurred scene data containing the object to be reconstructed (D1) and using the reconstructed background image ($I_r(x)$) to eliminate the background data from the image data to obtain a reconstructed image of an object with increased spatial resolution.

34 Claims, 17 Drawing Sheets

SUPER-RESOLUTION FLOW CHART
NON-LINEAR TECHNIQUE